

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-64. (canceled)

65. (currently amended) [[A polypeptide]] A fiber comprised of polypeptides comprising a reactable SCHAG amino acid sequence made according to a method comprising steps of:

- (a) identifying a SCHAG amino acid sequence, wherein polypeptides comprising the SCHAG amino acid sequence are capable of forming ordered aggregates;
- (b) analyzing the SCHAG amino acid sequence to identify at least one amino acid residue in the sequence having an amino acid side chain that is exposed to the environment in an ordered aggregate of polypeptides that comprise the SCHAG amino acid sequence;
- (c) modifying the SCHAG amino acid sequence by substituting an amino acid containing a reactive side chain for at least one amino acid identified according to step (b), thereby making a reactable SCHAG amino acid sequence; [[and]]
- (d) making a polypeptide comprising the reactable SCHAG amino acid sequence; and
- (e) aggregating polypeptides according to step (d) to form a fiber.

66. (canceled)

67. (currently amended) [[A]] An isolated filamentous polymer comprising polypeptide subunits coalesced into ordered aggregates, wherein at least one of the polypeptide subunits comprises a SCHAG amino acid sequence,

wherein the SCHAG amino acid sequence includes at least one substitution of an amino acid residue having a reactive amino acid side chain, and

wherein the reactive side chain of the substituted amino acid is exposed to the environment of the polymer to permit subsequent attachment of a substituent thereto.

68.-80. (canceled)

81. (currently amended) A purified fiber comprising an ordered aggregate of polypeptides that comprise polypeptide comprising an amino acid sequence that includes a SCHAG amino acid sequence, wherein the amino acid sequence has exactly two amino acid residues having selectively reactive amino acid side chains that are exposed to the environment and serve as selectively reactive sites in ordered aggregates of the polypeptide.

82.-100. (canceled)

101. (currently amended) A purified fiber comprised of an ordered aggregate of polypeptides that comprise polypeptide comprising a SCHAG amino acid sequence, wherein the SCHAG amino acid sequence includes at least one substitution of an amino acid residue having a reactive amino acid side chain, and wherein the substituted amino acid is exposed to the environment in an ordered aggregate comprised of said polypeptides.

102. (currently amended) A purified fiber polypeptide according to claim 101, wherein the SCHAG amino acid sequence comprises a member selected from the group consisting of SEQ ID NOs: 2, 4, 17, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 46, 47, and 50 and prion aggregation domain fragments thereof.

103. (currently amended) A purified fiber polypeptide according to claim 101, wherein the SCHAG amino acid sequence comprises the SUP35 amino acids 2 through 113 of SEQ ID NO: 2, or prion aggregation domain fragments thereof.

104. (currently amended) A purified fiber polypeptide according to claim 103, wherein the amino acid with the reactive amino acid side chain is selected from the group consisting of cysteine, lysine, tyrosine, serine, glutamate, aspartate, asparagine, glutamine, and arginine.

105. (currently amended) A purified fiber polypeptide according to claim 103, wherein the amino acid with the reactive amino acid side chain is selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine.

106. (currently amended) A purified fiber polypeptide according to claim 103, wherein the amino acid with the reactive amino acid side chain is cysteine.

107. (currently amended) A purified fiber polypeptide according to claim 106, wherein the polypeptides further include[[s]] an epitope tag.

108. (currently amended) A fiber polypeptide according to claim 106, wherein the polypeptides further include[[s]] a polyhistidine tag.

109. (currently amended) A fiber polypeptide according to claim 106, wherein the polypeptides further include[[s]] a substituent attached to the reactive amino acid side chain, the substituent selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, a carbohydrate, a fluorescent dye, a chromatic dye, an antibody, a growth factor, a hormone, a cell adhesion molecule, a toxin, a detoxicant, a catalyst, a light-harvesting substituent, and a light altering substituent.

110. (currently amended) A fiber polypeptide according to claim 106, wherein the substituent is a metal atom.

111.-115. (canceled)

116. (currently amended) A fiber comprised of an ordered aggregate of polypeptides that comprise polypeptide comprising a SCHAG amino acid sequence selected from the group consisting of: SEQ ID NOS: 2, 4, and 50, or fragments thereof, with the proviso that at least one amino acid in the SCHAG amino acid sequence has been substituted for by an amino acid with a reactive side chain, said amino acid with reactive side chain selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine, and wherein the polypeptides self-coalesce[[s]] to form higher ordered aggregates in which the reactive side chain is exposed to the environment.

117. (currently amended) A fiber polypeptide according to claim 116, wherein the SCHAG amino acid sequence comprises SEQ ID NO: 2, with the proviso that amino acid 184 of SEQ ID NO: 2 has been substituted for by an amino

acid selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine.

118. (currently amended) A fiber polypeptide according to claim 116, wherein the SCHAG amino acid sequence comprises SEQ ID NO: 2, with the proviso that amino acid 2 of SEQ ID NO: 2 has been substituted for by an amino acid selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine.

119. (currently amended) A polypeptide fiber according to claim 65, wherein the SCHAG amino acid sequence comprises a prion-aggregation amino acid sequence.

120. (canceled)

121. (currently amended) A polypeptide according to claim [[116]]  
144, wherein the polypeptide self-coalesces to form fibrous higher ordered aggregates.

122. (currently amended) A polypeptide according to claim 121, wherein amino acid 184 of SEQ ID NO: 2 the reactive side chain is exposed to the environment in the fibrous higher ordered aggregates.

123. (currently amended) A polypeptide according to claim 122, wherein ~~the SCHAG amino acid comprises SEQ ID NO: 2, and the substituted amino acid is amino acid 184 of SEQ ID NO: 2 is substituted for by a cysteine or glutamate.~~

124. (currently amended) A purified polypeptide comprising a SCHAG amino acid sequence that is at least 90% identical to amino acids 2 to 113 of SEQ ID NO: 2,

wherein the polypeptide self-coalesces into higher ordered aggregates,

wherein the SCHAG amino acid sequence comprises an amino acid with a reactable side chain selected from the group consisting of cysteine, lysine, glutamate, aspartate, and argine at position 2 of SEQ ID NO: 2 at least one substituted amino acid, with a reactable side chain compared to amino acids 2 to 113 of SEQ ID NO: 2, and

wherein the reactable side chain is exposed to the environment in the polypeptide aggregates.

125. (previously presented) A polypeptide according to claim 124, wherein the SCHAG amino acid sequence has exactly one of said amino acid with the reactive side chain.

126. (previously presented) A purified polypeptide according to claim 124, wherein the substituted amino acid is a cysteine or a glutamate residue.

127. (currently amended) A purified polypeptide comprising according to claim 124, wherein the polypeptide comprises a SCHAG amino acid sequence that is at least 90% identical to amino acids 2 to 253 of SEQ ID NO: 2

wherein the polypeptide self-coalesces into higher ordered aggregates,

wherein the SCHAG amino acid sequence comprises an amino acid with a reactable side chain selected from the group consisting of cysteine and argine at position 184 of SEQ ID NO: 2; and

wherein the reactable side chain is exposed to the environment in the polypeptide aggregates.

128. (previously presented) A polypeptide according to claim 127, wherein the SCHAG amino acid sequence has exactly one of said amino acid with the reactive side chain.

129. (currently amended) A purified polypeptide according to claim 127, wherein the ~~substituted~~ amino acid with the reactable side chain is a cysteine residue.

130. (previously presented) A purified polypeptide according to claim 127, wherein the polypeptide has substantially the same fiber forming properties as a polypeptide comprising amino acids 2 to 253 of SEQ ID NO: 2, as assessed by electron microscopy of polypeptide aggregates, to assess fiber morphology, and congo red binding to assess fiber assembly kinetics.

131. (previously presented) A purified polypeptide according to claim 127, wherein the polypeptide further exhibits substantially the same secondary structure as a polypeptide comprising 2 to 253 of SEQ ID NO: 2, as assessed by circular dichroism measurements at 208 and 222 nm.

132. (currently amended) A polypeptide according to claim 124 comprising an amino acid sequence identical to amino acids 2 to 113 of SEQ ID NO: 2, except for said ~~substituted~~ amino acid with the reactable side chain.

133. (currently amended) A polypeptide according to claim 127 comprising an amino acid sequence identical to amino acids 2 to 253 of SEQ ID NO: 2, except for said ~~substituted~~ amino acid with the reactable side chain.

134. (currently amended) A polymer comprising polypeptide subunits coalesced into ordered aggregates, wherein at least one of the polypeptide subunits comprises a polypeptide according to claim 124 or 127, ~~and~~

~~wherein the reactive side chain of the substituted amino acid is exposed to the environment of the polymer to permit subsequent attachment of a substituent thereto.~~

135. (previously presented) A polymer comprising polypeptide subunits coalesced into ordered aggregates, wherein all of the polypeptide subunits comprise a polypeptide according to claim 124 or 127.

136. (Canceled)

137. (previously presented) A polymer according to claim 134 that has a fiber morphology.

138. (previously presented) A polymer according to claim 137 attached to a solid support.

139. (currently amended) A fibrous polymer comprising polypeptide subunits coalesced into a fibrous aggregates, wherein at least one of the polypeptide subunits comprises a polypeptide according to any one of claims ~~65, 81, 101, 102, 103, 106, 107, 109, 110, 116, 117, or 118~~ 144-145.

140. (previously presented) A fibrous polymer according to claim 139, wherein the polymer is attached to a solid support.

141. (currently amended) A fiber polypeptide according to claim 65, wherein the identifying step comprises identifying a SCHAG amino acid sequence that is a prion aggregation domain.

142. (currently amended) A fiber polypeptide according to claim 65, wherein the identifying step comprises identifying a SCHAG amino acid sequence from yeast.

143. (previously presented) A polymer according to claim 67, wherein the SCHAG amino acid sequence comprises a prion aggregation domain of a yeast protein.

144. (new) A polypeptide comprising the SCHAG amino acid sequence of SEQ ID NO: 2, with the proviso that amino acid 184 of SEQ ID NO: 2 has been substituted for by an amino acid selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine, or comprising a fragment thereof that includes said substituted amino acid and that self-coalesces to form higher ordered aggregates.

145. (new) A polypeptide comprising the SCHAG amino acid sequence of SEQ ID NO: 2, with the proviso that amino acid 2 of SEQ ID NO: 2 has been substituted for by an amino acid selected from the group consisting of cysteine, lysine, tyrosine, glutamate, aspartate, and arginine, or comprising a fragment thereof that includes said substituted amino acid and that self-coalesces to form higher ordered aggregates.

146. (New) A purified fiber according to claim 101, wherein the SCHAG amino acid sequence comprises an amino acid sequence at least 70% identical to a member selected from the group consisting of SEQ ID NOs: 2, 4, 17, 19,

21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 46, 47, and 50 and prion aggregation domain fragments thereof.

147 (New) A purified fiber according to claim 101, wherein the SCHAG amino acid sequence comprises an amino acid sequence at least 90% identical to a member selected from the group consisting of SEQ ID NOs: 2, 4, 17, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 46, 47, and 50 and prion aggregation domain fragments thereof.

148. (New) A purified fiber comprised of an ordered aggregate of polypeptides that comprise a SCHAG amino acid sequence,

wherein the SCHAG amino acid sequence includes at least one amino acid residue having a reactive amino acid side chain that is exposed to the environment in an ordered aggregate comprised of said polypeptides, and

wherein the polypeptides further include a substituent attached to the reactive amino acid side chain, the substituent selected from the group consisting of an enzyme, a metal atom, an affinity binding molecule having a specific affinity binding partner, a carbohydrate, an antibody, a growth factor, a hormone, a cell adhesion molecule, a toxin, a detoxicant, and a catalyst.

149. (New) A purified fiber according to claim 148, wherein the SCHAG amino acid sequence comprises an amino acid sequence at least 70% identical to a member selected from the group consisting of SEQ ID NOs: 2, 4, 17, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 46, 47, and 50 and prion aggregation domain fragments thereof.